CITY OF GRAND JUNCTION, COLORADO

RESOLUTION No. 92-94

A RESOLUTION OF THE CITY OF GRAND JUNCTION, COLORADO ESTABLISHING A CROSS-CONNECTION CONTROL PROGRAM AND POLICIES TO REQUIRE ADEQUATE BACKFLOW PREVENTION PURSUANT TO 1) C.R.S. SECTIONS 25-1-107, 25-1-108, 25-1-109, AND 25-1-114, AS AMENDED AND 2) COLORADO PRIMARY DRINKING WATER REGULATIONS, ARTICLE 14 HAZARDOUS CROSS CONNECTIONS.

WHEREAS, the City of Grand Junction, on October 20, 1965 adopted section 21-1 of the City Code amended by ordinance 2481, enacted July 18, 1990, which adopted recent editions of various technical codes, including but not limited to the 1988 Uniform Plumbing Code, Chapter 10 Water Distribution, Section 1003 Cross-Connection Control.

NOW THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF GRAND JUNCTION THAT:

(I**)** THE CITY COUNCIL HAVING THE AUTHORITY TO IMPLEMENT AND MAINTAIN, AS OUTLINED AND CONTAINED BELOW, A CROSS-CONNECTION CONTROL PROGRAM, HEREBY ADOPTS THE FOLLOWING:

(a) Authority to implement and maintain this cross-connection control program is contained in, but not limited to, the following:

(1) 25-1-114, 25-1-114.1, C.R.S. (Colorado Department of Health)

(2) Colorado Primary Drinking Water Regulations Article 14, (Hazardous Cross-Connections).

(3) Cross-Connection Control, Colorado Department of Health, October 1, 1993.

(4) Occupational Safety and Health Administration Federal Register #202 part 2, page 22234, subparts J.

(5) 1991 edition of the Uniform Building Code or the more recently adopted version.

(6) 1991 edition of the Uniform Plumbing Code of the International Plumbing and Mechanical Officials or the more recently adopted version.

(7) 1988 edition of the Uniform Pool and Spa Code or the more recently adopted version.

(b) The listed reference manuals shall constitute guidelines concerning cross-connection control:

(1) Colorado Cross-Connection Control Manual, Colorado Department of Health, Revision October 1, 1993.

(2) "Cross-Connection Control Manual", EPA 570/9-89-007, June 1989.

(c) The following words shall have the meanings set forth:

(1) Air Gap - The unobstructed vertical distance through the free atmosphere between the lowest opening from any pipe or faucet supplying water to a tank, plumbing fixture, other device or vessel and the flood level rim of said vessel.

(2) Approved - means accepted by the water purveyor as meeting the applicable specification or procedures as stated or cited in this manual.

(3) Approved Backflow Prevention Device (Assembly) - means a device listed in the latest University of Southern California, Foundation for Cross-Connection Control and Hydraulic Research "List of Approved Backflow Prevention Assemblies", or any device listed and approved by ASSE, American Society of Sanitary Engineers.

(4) Auxiliary Water Supply - Any water supply on or available to the premises other than the water purveyor's approved potable water supply. These auxiliary water supplies may include, but are not limited to water from another purveyor's potable water supply or any natural source(s) such as a well, spring, river, stream, pond, lake, etc. or "used waters" or "industrial fluids." These waters may be polluted or contaminated, or may be objectionable and constitute an unacceptable water source over which the water purveyor does not have sanitary control.

(5) Backflow - means the undesirable reversal of, or the possibility thereof, the direction of flow of the water or mixtures of water and other liquid, gases, or other substances into the distribution pipes of the potable water supply from any source or sources caused by back pressure and/or back siphonage.

(6) Backflow Prevention Device or "backflow preventer" - A device or means designed to prevent backflow created by back pressure, back siphonage or back pressure and back siphonage acting together.

(7) Back Pressure - means backflow caused by a pump, elevated tank, boiler, or "head" in pipe, or any means that could create greater pressure within a piping system than that which exists within the potable water supply.

(8) Back siphonage - means the reverse flow of, or potential thereof, water or other liquids, mixtures, gases or substances into the distribution pipes of a potable water supply system caused by negative or sub atmospheric pressure in the potable water supply system.

(9) Certified Cross-Connection Control Technician - means a person who is a certified Cross-Connection Control Technician with a license issued by the Water Distribution and Waste Water Collection Systems Council.

(10) Check Valve - means a self-closing device which is designed to permit the flow of fluids in only one direction. A single check valve is not an approved backflow prevention device.

(11) Colorado Department of Health Cross-Connection Control Manual - A manual that has been published by the State addressing cross-connection control practices which shall be used as a guidance document for the wa-

ter purveyor in implementing a Cross-Connection Control Program. The latest revision of October 1, 1993.

(12) Containment - Protection by containment shall mean the installation of an approved backflow prevention device, or method, on the water service line(s) serving any premises, location, facility or area. Protection by containment shall be used when the potable water system may be contaminated or polluted by substances used or stored within a building or premises.

(13) Contamination - means an impairment of the quality of the potable water by sewage, industrial fluids or waste liquids, compounds or other materials to a degree which creates a potential hazard to the public health through a reduction in water quality or through the spread of disease or hazardous materials.

(14) Critical Level - means the critical level or other regulated "C/L marking" on a backflow prevention device or vacuum breaker which is a point conforming to approved standards and established by testing laboratory, which determines the minimum elevation above the flood-level rim of the fixture, highest point of usage,or receptacle served at which the device may be installed. When a backflow prevention device does not bear a critical level marking, the bottom of the vacuum breaker, combination valve, or the bottom of any such approved device shall constitute the critical level.

(15) Cross-Connection - means any physical arrangement whereby a potable water supply is connected, directly or indirectly, with any other water supply system, sewer, drain, conduit, tank, plumbing fixture, or other device which contains, or may contain, contaminated water, sewage, or other waste, liquid or gas of unknown or unsafe quality which may be capable of imparting contamination or pollution to the potable water supply as a result of backflow. Bypass arrangements, jumper connections, removable spools, swivel or changeover devices, four-way valve connections, and other temporary or permanent devices through which, or because of which, backflow could occur are included in the definition of cross-connection.

(16) Cross-Connections, Controlled - A connection made between a potable water system and a non-potable water system with an approved backflow prevention device, properly installed and tested in accordance with this manual, which will continuously afford the protection commensurate with the degree of hazard as determined by the Director of Public Works of the City.

(17) Double Check Valve Assembly, ("DC" or "DCVA") - An assembly of two independently operating approved check valves between two tightly closing (resilient seated) shut-off valves, plus four (4) properly located test cocks for the testing of each check valve. The entire assembly shall be an approved backflow prevention device.

(18) Flood-Level Rim - means the edge of the receptacle from which liquid overflows.

(19) Hazard, Degree of - the term is derived from an evaluation of the potential risk to public health and the adverse effect of the hazard upon the potable water system as determined by the Director of Public Works of the City.

(20) Hazard, Health - Any condition, device, or practice in the water supply system and its operation which could create, or in the judgment of the water purveyor may create, a danger to the health and well -being of a water consumer. An example of a health hazard is a structural defect, including cross-connections, in a water supply system, or a direct connectionof a potable water supply line to a sanitary sewer.

(21) Hazard, Plumbing - A plumbing type cross-connection in a potable water system that has not been properly protected by an air-gap separation or an approved backflow prevention device. Unprotected plumbing type cross-connections are deemed to be a health hazard.

(22) Hazard, Pollution - An actual or potential threat to the physical properties of the water system or to the potability of the public or the consumer's potable water system but which would constitute a nuisance or be aesthetically objectionable or could cause damage to the system or its appurtenances, but would not be a threat to life or be dangerous to health as determined by the Director of Public Works of the City.

(23) Hazard, System - An actual or potential threat of severe damage to the physical properties of the potable water system or the consumer's potable water system or of a pollution or contamination which would have a protracted effect on the quality of the potable water in the system caused by a cross-connection.

(24) Industrial Fluids System - Any system containing a fluid or solution which may be chemically, biologically, radiologically, or otherwise contaminated or polluted in a form or concentration that would constitute a health, system, pollution or plumbing hazard if introduced into an approved water supply. This may include, but not be limited to: polluted or contaminated waters; all types of process waters and "used waters" originated from the potable water system which may have deteriorated in sanitary quality; chemicals in fluid form; plating acids and alkalis: circulated cooling waters connected to an open cooling tower and/or cooling towers that are chemically or biologically treated or stabilized with toxic substances; contaminated natural waters such as from wells, springs, streams, rivers, lakes, dams, ponds, retention pits, irrigation canals or system, etc.; oils, gases, glycerin, glycols, paraffins, caustic and acid solutions and other liquid and gaseous fluids used in industrial or other purposes or for fire-fighting purposes.

(25) Isolation - The control of cross-connections within a building's plumbing system by the installation of approved backflow prevention devices or methods at or mean the potential sources of pollution or contamination.

(26) Non-Potable Water - means water that is not safe for human consumption or that does not meet therequirements set forth in the State of Colorado Primary Drinking Water Regulations.

(27) Pollution - means the presence of any foreign substance (organic, inorganic, radiological or biological) in the water that may degrade the water quality so as to constitute a non-health type hazard or impair its usefulness.

(28) Potable Water - means water free from impurities in amounts sufficient to cause disease or harmful physiological effects. The bacteriological, chemical, and radiological quality shall conform with

State of Colorado Primary Drinking Water Regulations.

(29) Reduced Pressure Principle Device or Reduced Pressure Zone Device "RPZ" - An assembly of two independently operating approved check valves with an hydraulic automatic operating differential relief valve between the two check valves. The assembly shall be located between two (2) tightly closing (resilient seated) shut-off valves, and have four (4) properly located test cocks for the testing of the check and relief valves. The entire assembly shall be an approved backflow prevention device.

(30) Submerged Inlet - means a water pipe or extension thereof from a potable water supply terminating below the flood level rim of a tank, vessel, fixture or appliance which may contain water of questionable quality, waste or other contaminant or pollutant.

(31) Vacuum - means any pressure less than atmospheric pressure.

(32) Vacuum Breaker, Atmospheric Nonpressure Type - means a vacuum breaker consisting of an air inlet opening and a non-loaded floating check disk valve designed to prevent back siphonage only. The device shall not be subjected to continuous static line pressure or back pressure or be installed where it would be under pressure for more than twelve (12) continuous hours.

(33) Vacuum Breaker, Pressure Type - means a vacuum breaker, designed to prevent back siphonage only, consisting of a spring loaded check valve, a spring- loaded air inlet opening, a tightly closing shut off valve on each side of the device, and two (2) appropriately located test cocks. The device shall not be subjected to back-pressure. The entire assembly shall be an approved backflow prevention device.

(34) Water Distribution and Wastewater CollectionSystems Certification Council - means the group which has been designated by the Colorado Department Health to administer and maintain the Cross-Connection Con-trol Technician certification program.

(35) Water Purveyor or "Water Supplier" - means any person or group owning and/or operating a public potable water supply.

(36) Water-Service Connection - means the terminal end of the water purveyor's service connection from the potable water distribution system; i.e., where the water purveyor loses jurisdiction and sanitary control over the water as its point of delivery to the customer's stop box or shut-off valve or meter, which ever comes first from the water main. If a meter is installed at the end of the service connection, the service connection shall mean the downstream end of the meter. There shall be no unprotected takeoffs from the service line ahead of any meter or backflow prevention device located at the point of delivery to the customer's water system. This shall include irrigation systems and fire sprinkler systems. Service connection shall also include water service connection from a hydrant and all other temporary or emergency water service connections from the potable water system. For customers outside the water purveyor limits, "water service connection" shall mean the terminal end of the water purveyor's service connection from the potable water system to the customer's corporation stop.

(d) General Requirements:

(1) All building plans must be submitted to the County building department and approved, prior to the issuance of water service. Building plans must show:

a. Water service type, size and location;

b. Meter size and location;

c. Backflow prevention device size, type and location; and

d. Fire sprinkling system(s) service line, size and type of backflow prevention device if applicable.

(e) Standards for Backflow Prevention Devices:

(1) Any backflow prevention device required herein shall be of a model and size approved by the City of Grand Junction. The term "Approved Backflow PreventionDevice" shall mean a device that has been manufactured in full conformance with the standards established by the Colorado Department of Health Cross-Connection Manual and by the City of Grand Junction. Final approval shall be evidence by a "Certificate of Approval" issued by an approved testing laboratory certifying full compliance with Colorado Department of Health standards and Foundation for Cross-Connection Control and Hydraulic Research specifications. The customer shall have 45 days to respond to the City's request for information on the "Cross Connection Survey Form" (Exhibit "A") and one (1) year from date of notification by the City to come into compliance if a backflow device is required.

(2) Applicability:

a. No grandfather clause exists. All laws and regulations apply as of the adoption hereof regardless of the age of the facility.

b. All fire sprinkler systems shall conform to the following sections of the National Fire Protection Association pamphlets number thirteen and twenty four: Pamphlet number thirteen, sections 1-11.2 Hydrostatic Testing and sections 1-1.2.2 Allowable Leakage. Pamphlet number twenty-four, "Private Fire Service Mains and Their Appurtenances":, Section 8.4.

1. All fire sprinkling lines shall have a minimum protection of an approved double check valve for containment of the system.

2. Backflow devices used on fire lines shall have O.S. & Y. (outside stem & yoke) valves and be listed by the National Fire Protection Association.

c. All glycol (ethylene or propylene), or anti-freeze systems shall have an approved Reduced Pressure Zone Device for containment.

d. Dry fire systems shall have an approved Double Check Valve installed upstream of the air pressure valve.

e. Single family residence with a fire sprinkler system and domestic water combined shall have a double check valve when no chemicals are used.

f. Only approved backflow prevention devices shall be used. See the latest Foundation for Cross-Connection Control and Hydraulic Research "Approved Device List."

Exception:

Residential containment may be accomplished with a device not approved by the Foundation for Cross-Connection Control and Hydraulic Research, but approved by the American Society of Sanitary and Mechanical Engineers and designated by the Director of Public Works of the City.

g. Backflow preventers currently installed which are not approved shall be replaced with an approved device at the time they fail an operational test.

(f) Installations:

(1) Backflow prevention devices shall be installed in accordance with approved designs.

(2) Backflow prevention device installations shall be inspected and approved for use by the County building department.

(3) All backflow devices shall be installed in the horizontal position except that devices manufactured and identified for other alignments may be installed if in accordance with said design of manufacture.

(4) A pressure vacuum breaker shall be used where the device is never subjected to back pressure and installed a minimum of twelve (12) inches above the highest piping or outlet downstream of the device in a manner to preclude back pressure.

(5) An atmospheric vacuum breaker shall be used only where the device is:

a. Never subjected to continuous pressure (more than 12 hours continuous); and

b. Installed with the air inlet in a level position and a minimum of six (6) inches above the highest piping or outlet it is protecting.

(6) The single check valve is not considered to be a backflow prevention device.

(7) Double check valve assemblies may be installed in below

grade vaults when these vaults are properly constructed in accordance with approved plans and then insulated to prevent freezing.

(8) Reduced pressure backflow preventers will be installed above ground. The unit should be placed at least twelve inches (12) above the finish grade to allow clearance for the repair work. A concrete slab at finish grade is recommended. Proper drainage should be provided for the relief valve and may be piped away from the location provided it is readily visible from above grade and provided the relief valve is separated from the drain line by a minimum of double the diameter of the supply line. A modified vault installation may be used if constructed with ample side clearances. Freezing is a major problem in this area. Precautions should be taken to protect above ground installations.

(9) Backflow prevention devices shall be installed in an accessible location to facilitate maintenance, testing and repair.

(10) All backflow prevention devices shall be installed immediately downstream of the water meter.

(11) Before installing a backflow prevention device, pipelines should be thoroughly flushed to remove foreign material.

(12) In no case will it be permissible to have connections or tees between the meter and service line backflow prevention device.

(13) In no case is it permissible to connect the relief valve discharge on the reduced pressure device into a sump, drainage ditch, etc.

(14) Backflow prevention valves are not to be used as the inlet or outlet valve of the water meter. Test cocks are not to be used as supply connections. (Not applied to residential dual check installations.)

(15) In order to insure that backflow prevention devices continue to operate satisfactorily, it will be necessary that they be tested at the time of installation and on an annual schedule thereafter. Such test will be conducted in accordance with University of Southern California, Foundation For Cross-Connection control And Hydraulic Research performance standards and field test procedures as directed by the Colorado Department of Health.

(16) The County building department will inspect all installations.

(17) All costs for design, installation, maintenance, repair, and testing are to be borne by the customer.

(g) Testing and Maintenance:

(1) At least once per year, each customer/user at any premise(s) where any backflow prevention devices(s) is (are)

installed shall have a certified test made of these devices and deliver to the City a copy of the test. In those specific instances where the Director of Public Works of the City deems the hazard to be great enough, certified inspections and test at more frequent intervals may be required. All tests shall be at the expense of the water user and shall be performed by a certified technician . An inspection of the device may be performed at any time complying with section "(h)" of this document.

(2) As necessary, the device shall be repaired or replaced at the expense of the customer/user whenever the device(s) is (are) found to be defective. Records of all such tests, repairs or replacement shall be kept by customer/user, a copy of which shall be submitted within 60 days to the Director of Public Works of the City.

(3) Existing devices shall be sealed by the certified technician performing the test at the completion of the test.

(4) All testing gages used in the City of Grand Junction water system shall be checked for accuracy with a water column yearly, or more often, and proof of compliance shall be submitted to the Director of Public Works of the City upon request.

(5) The City of Grand Junction retains the right to test or otherwise check the installation and operation of any containment device at anytime to assure proper operation.

(h) Right of Entry:

A representative of City of Grand Junction will carry proper credentials of his/her office. By previously arranged appointment and upon presentation of proper credentials, the City of Grand Junction representative shall have the right of entry to inspect any and all buildings and premises for cross-connections relative to possible hazards. This right of entry shall be a condition of water service in order to protect the health, safety and welfare of the people throughout City of Grand Junction distribution system. Where building security is required, the backflow device(s) shall be located in an area not subject to security. Questions regarding proper credentials should be directed to the Director of Public Works of the City of Grand Junction.

(i) Compliance:

(1) Failure of the customer to cooperate in the installation, maintenance, testing or inspection of backflow prevention devices required by this resolution shall be grounds for the discontinuance of water service to the premises or the requirement for an air-gap separation from the public potable water system.

(2) Service of water to any premises may be discontinued by the City of Grand Junction if unprotected cross connections exist on the premises. When any defect is found in an installed backflow prevention device, or if a backflow prevention device

has been removed or bypassed, the service may be discontinued. Service shall not be restored until such conditions or defects are corrected.

(3) Discontinuance of service may be summary, immediate, and without written notice whenever, in the judgment of the City of Grand Junction, such action is necessary to protect the purity of the public potable water supply or the safety of the water system.

PASSED and ADOPTED this 19th day of October, 1994

Attest:

/s/ Stephanie Nye
City Clerk

/s/ R.T. Mantlo
President of Council